

**International Lake Superior  
Board of Control  
Semi-Annual Progress Report to the  
International Joint Commission  
Covering the period September 6, 2007 to March 19, 2008**

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**Cover: “Sand Bay” (north of Sault Sainte Marie, Ontario, Canada on the Lake Superior side of the peninsula that defines the western side of Goulais Bay) Photo taken by David Fay on June 14, 2007.**

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# International Lake Superior Board of Control

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March 19, 2008

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Commissioners:

This semi-annual report covers the Board's activities from September 6, 2007 to March 19, 2008.

## 1. Highlights

During the past six months, the water levels of lakes Superior and Michigan-Huron remained below average. While Lake Superior's September level was below that of last year, October through February levels were higher than those of a year ago. Lakes Michigan-Huron levels were well below those of last year's. The remaining Great Lakes were near their one year ago levels.

Lake Superior levels in August and September established new record lows of 183.01 m (600.43 ft) and 183.02 m (600.46 ft) respectively, 1 cm (0.4 in) and 10 cm (4 in) respectively below the previous records set in 1926. The level of Lake Superior has been consistently below average since April of 1998, which is the longest sustained period of below-average monthly levels in the 1918-2007 period of record. The level of Lakes Michigan-Huron has been below average since January of 1999, the second longest period on record of consistently below average levels.

The Lake Superior outflows were as specified by Regulation Plan 1977-A. Since September, the monthly outflows from the lake have been between 66% and 89% of average. The Lake Superior net basin water supply was well above average while that to the Lakes Michigan-Huron basin was below average over the September 2007 through February 2008 period.

The IJC's decision to lower the threshold level at U.S. Slip Gauge from 176.39 m IGLD 1985 to 176.09 m IGLD 1985 was first applied in November 2007. Ponding by the hydropower entities was restricted on weekends and holidays from September 2007 through January 15, 2008, the closing date for the commercial navigation season. No concerns related to peaking and ponding were reported to the Board during the period.

This period of sustained low lake levels and outflows continues to have significant impacts on

stakeholders in the upper Great Lakes region. Significant public and media attention continues in both the U.S. and Canada. The Board is aware of the detrimental effects to navigation, hydropower, tourism, industrial and shoreline interests, and anticipates continued widespread concerns should these conditions continue or worsen. In September 2007, the Board considered possible actions that could be taken to alleviate the low levels and concluded that minimal impacts on lake levels would be achieved without causing disbenefit to either Lake Superior or Lakes Michigan-Huron.

## **2. Monitoring of Hydrologic Conditions**

The Board continuously monitors the water levels of lakes Superior and Michigan-Huron, and the water levels and flows in the St. Marys River. The Regulation Representatives' monthly reports to the Board provide hydrologic assessments and recommendations on the regulation of outflows from Lake Superior. These reports indicate the amount of water available for hydropower purposes, after the requirements for domestic use, navigation, and the fishery (St. Marys Rapids) were met.

Tables 1 and 2 list the recent monthly water levels, net basin supplies, and outflows for lakes Superior and Michigan-Huron, respectively. Figure 1 compares the monthly water levels for this period to long-term averages and extremes. Figure 2 shows the monthly precipitation over the lakes Superior and Michigan-Huron basins. Figure 3 shows the monthly net basin supplies for the basins.

Overall, precipitation over the Lake Superior basin was above average from September 2007 through February 2008 at 134% of average for the period. Provisional record highs occurred in September (170 mm or 6.71 inches) and October (144 mm or 5.68 inches) while November, January and February were below average. The current records of 163 mm (6.43 inches) and 142 mm (5.61 inches) were set in 1941 and 1995 respectively. Due to the significant amount of precipitation that fell, the September through February sequence of precipitation in the Lake Superior basin would be expected to be exceeded 4% of the time. The net basin supplies, which are the net effect of precipitation, evaporation and runoff to the lake, were well above average in September and October 2007 (provisional new record high). The provisional record setting October 2007 net basin supply was 6,390 m<sup>3</sup>s (225.7 tcf) which is significantly higher than the current record of 4,860 m<sup>3</sup>s (171.6 tcf) set in 1982. The September through February sequence of net basin supplies to Lake Superior would be expected to be exceeded 8% of the time. It should be noted that the six month supply sequence experienced during the reporting period contains an extremely high supply and great variability. The average of the six month supply is somewhat skewed by the provisional record high in October 2007.

Lake Superior's water level remained below chart datum (183.2 m or 601.1 ft) during the period except for brief excursions above it during October and November. Monthly mean Lake Superior levels between September and February ranged from 25 cm (10 in) to 52 cm (20 in) below their long-term average. On March 19, 2008, its level was 182.98 m (600.3 ft), which was 27 cm (11 in) below average and 19 cm (7 in) higher than a year ago. The level of Lake Superior has been consistently below average since April 1998, which is the longest sustained period of below average monthly levels in the 1918-2007 period of record.

Snow survey flights to determine the snow pack on the entire Lake Superior basin were made the first week of March 2008. Based on snow survey data the snow water equivalent (SWE) was near average and significantly higher than last year's 41% of average. On average, the majority of the Lake Superior Basin has about 10 cm (4 in.) of SWE with locally higher amounts. Note that the correlation between SWE and lake level rise is limited.

Precipitation over the Lakes Michigan-Huron basin was slightly above average (107% of average) for the period and had a probability of exceedance value of 34%. October and December through February were above average, while September and November were below average. As a whole, the September through February sequence of net basin supplies to Lakes Michigan-Huron was very close average and would be expected to be exceeded more than 54% of the time. It should be noted that the six month supply sequence to the Lakes Michigan-Huron basin during the reporting period had great variability, ranging from record low values in November to record high values in January.

Monthly mean Lakes Michigan-Huron levels ranged from about 54 cm (21 inches) to 67 cm (26 inches) below long-term averages from September to February. Water levels have been below chart datum (176.0 m or 577.5 ft.) since August 16, 2007. On March 19, 2008 the level of Lakes Michigan-Huron was at 175.77 m (576.7 ft), 55 cm (22 in) below average and 15 cm (6 in) lower than a year ago. The level of Lakes Michigan-Huron has been below average since January 1999, the second longest sustained period of below-average monthly levels on record. Low lake levels have resulted in four vessels running aground due to shoaling at the entrance to Muskegon Harbor on Lake Michigan.

### **3. Regulation of the Outflow from Lake Superior**

The outflows of Lake Superior were as specified by the Regulation Plan 1977-A from September through February. Lake Superior outflows were 76% of average during the September through February period ranging from 1560 m<sup>3</sup>/s to 1730 m<sup>3</sup>/s (55 to 61 tcfs). Outflows were limited by Criterion (c) from January through March 2008, and were restricted to the normal minimum outflow prescribed by Plan 1977-A from September through November, 2007.

The gate setting at the Compensating Works supplying the main portion of the St. Marys Rapids was at an equivalent one-half gate open, four gates set at 20 cm (8 inches), for the past six months. Gate No. 1, which supplies water to the fishery Remedial Works, remained set at 15 m<sup>3</sup>/s (530 cfs) throughout the period.

Several scheduled and unexpected flow reductions were experienced at the three hydropower plants. All flow reductions were easily offset within each month. When units were taken off-line, water levels at U.S. Slip gauge fell but quickly rose again as idled units were brought back on-line. No problems related to water levels were reported as a result of these variations. No ships were reported delayed due to the flow variations. Details are provided in Section 10.

In September 2007, the IJC requested the Board to consider if there were any actions that could be taken to help alleviate the low water level conditions. The Board looked at a number of under- and over-discharge scenarios, all of which would require prior Commission approval. These scenarios

showed that without causing disbenefit to either lake, under- and over- discharging would minimally help the lake levels of both Lake Superior and Lakes Michigan-Huron. The Commission agreed with the Board's recommendations and no deviations were made from the regulation plan.

To facilitate the Canadian gate refurbishment program on June 27, 2007, Gates 7, 8, 9 and 10, normally open 20 cm (8 in) to maintain a one-half gate setting flow in the rapids, were closed and gates 12 through 15 were each opened to the 20 cm (8 in) equivalent opening. On November 13, 2007, Gates 12 through 15 were closed and Gates 7 through 10 were reopened to a 20 cm (8 in) setting. The dewatering structure was removed from refurbished Gates 3 and 5 on October 15.

#### **4. Governing Conditions During the Reporting Period**

The monthly mean levels of Lake Superior ranged between 183.02 m and 183.18 m (600.5 ft. and 601.0 ft.), within the limits of 182.76 m and 183.86 m (599.6 ft. and 603.2 ft.) specified in the Commission's Orders of Approval.

The daily mean water levels in the lower St. Marys River at the U.S. Slip Gauge downstream of the U.S. Lock varied between elevation 175.77 m and 176.40 m (576.6 ft. and 578.7 ft.). Thus, the requirement for maintaining the level below 177.94 m (583.8 ft.) was satisfied. The daily mean U.S. Slip gauge level was below chart datum of 176.39 m (578.7 ft.) for all but one day of the reporting period.

#### **5. Inspections and Repairs at the Compensating Works**

Ongoing routine maintenance and inspections of the Compensating Works were undertaken in the past six months. The structure is generally in good condition. Brookfield Power's refurbishment program started July 17, 2007 with Gates 3 and 5. Unexpected, extensive repairs to the counterweights were necessary, but otherwise the gates were found to be in good condition. Work for 2007 ended with removal of the dewatering structure on October 15 and re-setting of the gates to their normal openings on November 13, 2007. Two of either Gates 4, 6, 7 or 8 will be refurbished this year between June and October. Steel armour plates will be added on the upstream noses of Piers 6, 7, and 8 at this time. Work on Gates 1 and 2 has been deferred to either 2009 or 2010, once the Ontario Ministry of Natural Resources outlines flow requirements and approval conditions for the closing of Gate 1 (which controls the release of water to the fish spawning and aquatic habitat zones along the south shore of Whitefish Island).

#### **6. Repairs and Maintenance at the Hydropower Facilities**

##### *a. U.S. Government Hydropower Plant*

As reported previously, the runner for Unit No. 10 was damaged by cavitation. Temporary repairs were made and the unit is still operational and is running while permanent repair plans are formulated. Expectations are that repairs will be completed before the end of FY08. In mid-February, units were also taken off line for short periods for normal inspection and maintenance and on March 4, 2008, Unit 10 was down for 3.48 hours for repairs. The under-reporting

adjustment of 9% continues to be applied while the inconsistency between measured and reported flows is investigated.

*b. Brookfield Power*

Scheduled maintenance outages were undertaken at the Brookfield Power plant on October 6 and 7 to facilitate the annual underwater cable inspection and maintenance for Lake Superior Power Ltd. and a diving inspection of Parks Canada's effluent pipe in the Clergue tailrace. The pipe was found to be covered with concrete and rocks and since visible inspections are not possible, future assessments will use alternative means such as flow or pressure testing. A safety boom was also installed in the tailrace at this time. This boom failed on November 19 and will be repaired in the spring.

Shutdowns are scheduled for Unit 2 from March 14 to 21 (3-year inspection), and Unit 1 from March 24 to 28 and Unit 3 from April 7 to 11 (1-year inspections).

*c. Edison Sault Electric Company*

Routine maintenance was conducted during the reporting period. Occasional high winds out of the west interrupted generation due to lowering of the water level in the tailrace and allowing air into the draft tubes which breaks the vacuum for short periods. This problem can occur for about an hour each time Brookfield Power goes off-peak at night. Such problems were encountered on December 3, 2007 and January 9, 2008. ESELCO will be performing a major overhaul of its Unit No. 33. This will not affect generating capacity as flow allocations are low and not all of the seventy-four units are in service. During the colder winter months, ESELCO must maintain a minimum flow through its generating facility of 310 to 340 m<sup>3</sup>/s (10.9 to 12.0 tcfs) in order to generate enough heat to prevent freezing of the forebay equipment in the building. This can require transfer of some of the U.S. Government hydroplant's allocation to ESELCO in order to maintain the required minimum flow. Such transfers were not necessary during the reporting period.

## **7. Flow Verification Measurements**

No flow verification measurements were performed during the reporting period. The following update relates to previous measurements.

*U.S. Government Hydropower Plant*

On December 12, 2007, Hatch Acres Corporation began their review of flow data and programming of the System Control and Data Acquisition (SCADA) system to resolve the differences between flow measurements and the SCADA output. It appears that for more accurate flow readings at or near maximum power, the SCADA should be programmed to calculate flow based on turbine wicket gate opening and head rather than power and head. The preliminary results show an average of 3% increase in flow. A final report is expected to be completed March 31, 2008. The 9% adjustment to compensate for under reporting will continue in the interim.

## **8. Water Usage in the St. Marys River**

Table 3 (Table 4 in cubic feet per second) lists the distribution of outflows from Lake Superior for January 2007 through February 2008. Water uses are divided into four categories: domestic, navigation, fishery, and hydropower. According to the 1979 Supplementary Order, after the first three water requirements are satisfied, the remaining outflow is shared equally between the U.S. and Canada for hydropower purposes. Any remainder, beyond the flow capacity of the hydropower plants, is discharged through the Compensating Works into the St. Marys Rapids.

As shown in the tables, the monthly mean amounts of water used for domestic and industrial purposes ranged from 10 to 11 m<sup>3</sup>/s (353 to 388 cfs), or 0.6 to 0.7% of the total monthly outflow from September 2007 through February 2008.

The monthly flow through the U.S. and Canadian locks depends on traffic volume and varied from 2 to 15 m<sup>3</sup>/s (71 to 530 cfs). As a percentage of the total river flow, water allocated for navigation varied seasonally from as little as 0.1% (when the locks were closed for the winter) to about 1.0% of the total river flow in the busiest part of the navigation season.

The U.S. locks closed on January 15, 2008, as scheduled and will re-open on March 25, 2008. The Canadian lock closed early for the season on September 22, 2007 and is expected to reopen May 15, 2008. The early closure resulted from a malfunction of the lock program logic controller during a September electrical storm.

In accordance with the Commission's Orders to fulfill the fishery needs in the main rapids, a minimum gate setting of one-half gate open is required at all times at the Compensating Works. A setting equivalent to one-half gate open for the main rapids is maintained by having four gates partially open to supply the same quantity of water as one gate half open. This spreads the flow more evenly across the main rapids, and is thought to reduce potential damage from ice floes impacting the gates in the winter. In addition, a flow of at least 15 m<sup>3</sup>/s (530 cfs) is required in the Fishery Remedial Works (through Gate 1). The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, ranged from 81 to 89 m<sup>3</sup>/s (2,860 to 3,140 cfs) between September 2007 and February 2008.

The hydropower plants used an average of 1,520 m<sup>3</sup>/s (53.7 tcfs) from September 2007 through February 2008 for electric power production. The allocation for this period averaged 1,520 m<sup>3</sup>/s (53.7 tcfs). Usages at each plant are shown in Tables 3 and 4.

## **9. Long Lac and Ogoki Diversions**

Ontario Power Generation (OPG) continued to provide the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversions into Lake Nipigon (which flows into Lake Superior) averaged 110.4 m<sup>3</sup>/s (3,900 cfs) and the Long Lac Diversion averaged 59.4 m<sup>3</sup>/s (2,100 cfs) from September 2007 – February 2008. Combined, these diversions were about 122 percent of average for the September through February

period 1944-2007.

During the reporting period, heavy rains in the fall resulted in water being spilled northward into the Ogoki River and from Long Lake, reducing the amount diverted to Lake Superior. An average flow of 262.5 m<sup>3</sup>/s (9,270 cfs) was spilled into the Ogoki River from October through December. Additionally, slots have recently been cut into Waboose Dam to provide a minimum flow northward into the Ogoki River of approximately 2 m<sup>3</sup>/s (70 cfs) to meet fisheries requirements. An additional average discharge of 48.5 m<sup>3</sup>/s (1,710 cfs) was spilled northward from Long Lake in October due to unusually heavy rainfall in the immediate area.

## **10. Peaking and Ponding Operations at Hydropower Plants**

Peaking and ponding operations are the within-day and day-to-day flow variations that enable the hydropower plants to better match their electricity production with demand. However, these variations cause the water levels in the St. Marys River downstream of the plants to fluctuate more than they otherwise would. The Commission has approved guidelines within which the Board may restrict peaking and ponding operations by the hydropower entities under certain conditions. Specifically, if the minimum level at the U.S. Slip gauge on the lower river is expected to be below the threshold level of 176.09 m as a result of ponding operations, then the power entities are required to pass peak flows for at least an 8-hour period each day to provide periods of relatively higher levels on the lower St. Marys River each day. The Board provides summaries of peaking and ponding in its semi-annual reports. The Commission's guidelines are to be examined on a five year basis by the Board, starting with the last year of the International Upper Great Lakes Study or 2010, whichever comes first.

On October 17, 2007 the IJC notified the Board of its acceptance of the Board's recommendation that the threshold level at U.S. Slip Gauge for determination of suspension of ponding be lowered from 176.39 m (gauge datum) to 176.09 m IGLD 1985. The new threshold level was first applied in November 2007.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. From September 2007 through January 15, 2008 the weekend minimum levels at the U.S. Slip site were expected to be below the threshold level. As a result, the hydropower companies were required to restrict ponding operations on weekends and holidays during the September 2007 through January 15, 2008 period. From January 16<sup>th</sup> through March 19<sup>th</sup>, levels were of no concern to navigation, and ponding was permitted. It is expected that on March 25<sup>th</sup> when the Soo Locks reopen for shipping that the U.S. Slip Gauge level will be below threshold and ponding will be suspended on the final weekend in March.

To continue to provide timely information on expected flow variations to the users, the Corps distributes monthly notices during the shipping season (March through January) on expected Lake Superior outflows, and a schedule of flow variations at the hydropower plants. No concerns related to peaking and ponding were reported to the Board during the period.

Generally low lake, connecting channel and harbor levels were a continuing problem to shippers requiring light loading of vessels in many cases.

Figures 4a – 4f compare the hourly Lake Superior outflow and the hourly levels at U.S. Slip on the lower St. Marys River. In general, U.S. Slip levels were significantly lower than during the same period last year. New record low monthly mean levels at U.S. Slip were set during February, March, and July through December 2007 as well as January 2008.

## **11. Annual Meeting with the Public and Public Information**

The Board will hold its 2008 annual meeting with the public on June 12. The tentative location is Sault Sainte Marie in Ontario Canada, with a call-in option for interested parties. The Board recognizes the need to coordinate its public communication activities with the International Upper Great Lakes Study Board to avoid possible confusion of the roles and responsibilities of the two Boards by stakeholders.

The Board continues to issue, at the beginning of each month, news releases informing the public about Lake Superior regulation and water level conditions. The Board provides monthly media releases and hydrologic update information to the Commission to maintain a Board web site. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports, meeting minutes and hydrologic data summaries. In addition, in support of the Board and the Commission, the Detroit District Corps of Engineers maintains additional technical information on its own Board Web site.

## **12. Related Items of Interest**

### *a. Great Lakes / St. Lawrence Seaway Study*

Work is almost complete on the Great Lakes / St. Lawrence Seaway Study. This binational Study, being co-managed by Transport Canada and the U.S. Army Corps of Engineers, and being overseen by a Steering Committee consisting of several U.S. and Canadian agencies, is looking at the engineering aspects and cost of maintaining the present navigation system over the next 50 years. The Study is also looking at the implication this has on the region's economy and environment. No expansion of locks or connecting channel size is being considered.

Great Lakes Navigation System Review - Section 456 of WRDA 1999 directed the Corps to, in consultation with the St. Lawrence Seaway Development Corporation, review the feasibility of improving commercial navigation on the Great Lakes navigation system. An initial Reconnaissance Report was approved in 2003 as a basis for further study efforts to support a Federal decision to proceed with feasibility phase studies. A supplement to this report is being prepared to provide a baseline for the project conditions for the environment, engineering features and economic conditions of the system. Canada and the U.S. completed a bi-national report (Great Lakes St. Lawrence Seaway Study) in the Fall of 2007 which focused on the system's locks, the majority of which are located on the St. Lawrence Seaway. This bi-national effort generated much of the required baseline data for the system,

involved significant regional stakeholder involvement, and is the basis of a decision to not proceed with any further efforts related to St. Lawrence Seaway system expansion.

FY08 funds are being used to complete the supplemental reconnaissance effort, focusing on establishing baseline conditions for the balance of the system infrastructure, primarily federally maintained ports, including port structure (breakwaters, revetments, etc.) and channel (dredging/disposal) maintenance requirements. The supplemental reconnaissance report will provide the baseline maintenance requirements and economic factors necessary to plan for the optimal approach to meeting the navigation needs, and serve as the basis for a final determination as to the Federal interest in proceeding with any feasibility efforts. In FY09, the supplemental report will be shared with interested Federal and State entities, as well as the public, for review prior to deciding if further studies are warranted.

*b. Lock Replacement at Sault Ste. Marie, Michigan*

A new "Poe-sized" lock is proposed to replace the existing Davis and Sabin Locks at the Soo Locks complex at Sault Ste. Marie, MI. The purpose of this project is to provide for more efficient movement of waterborne commerce. The Water Resources Development Act of 2007 directs that construction of the new lock shall be a U.S. Federal expense. This eliminates the need for a Project Cooperation Agreement since no real estate or non-Federal funds are necessary.

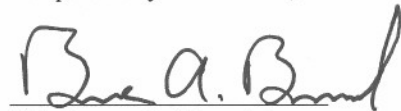
Funds in the amount of \$1,968,000 have been appropriated for FY 2008. These funds will be utilized to prepare a letter report documenting the actions necessary to move the project forward to construction, complete National Environmental Policy Act (NEPA) compliance activities, update cost information, and prepare an implementation schedule. Plans and specification for the cofferdam construction package will be finalized for a possible FY 2009 construction start if funds are appropriated by Congress. Additionally, design efforts will continue on the other project features.

**13. Board Membership and Meetings**

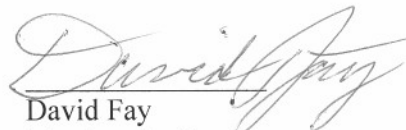
There was no change in the Board membership during the reporting period.

The Board held a meeting on March 19, 2008 in Rochester, New York with the U.S. alternate member and Canadian member in attendance.

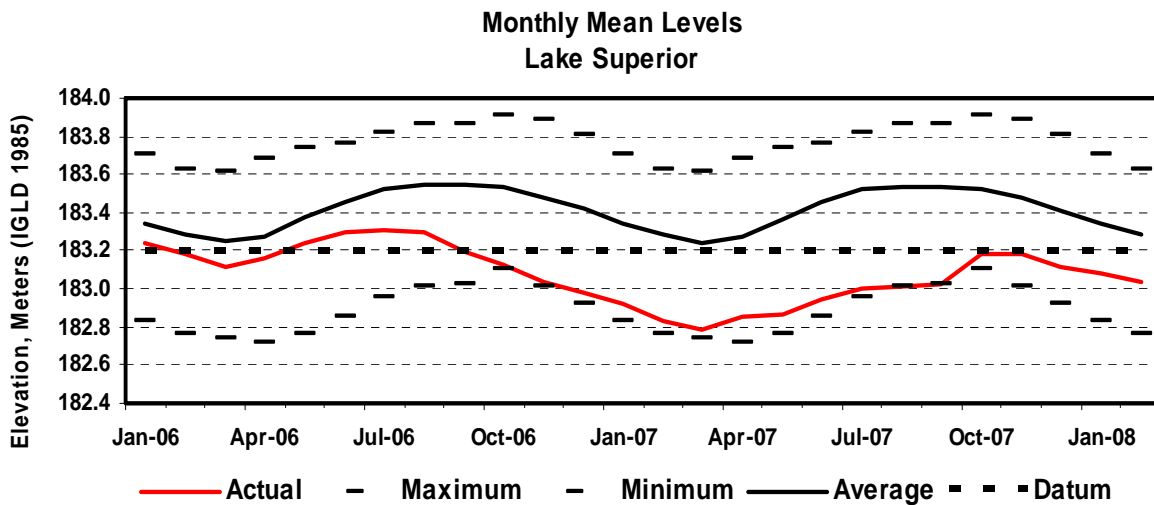
Respectfully submitted,



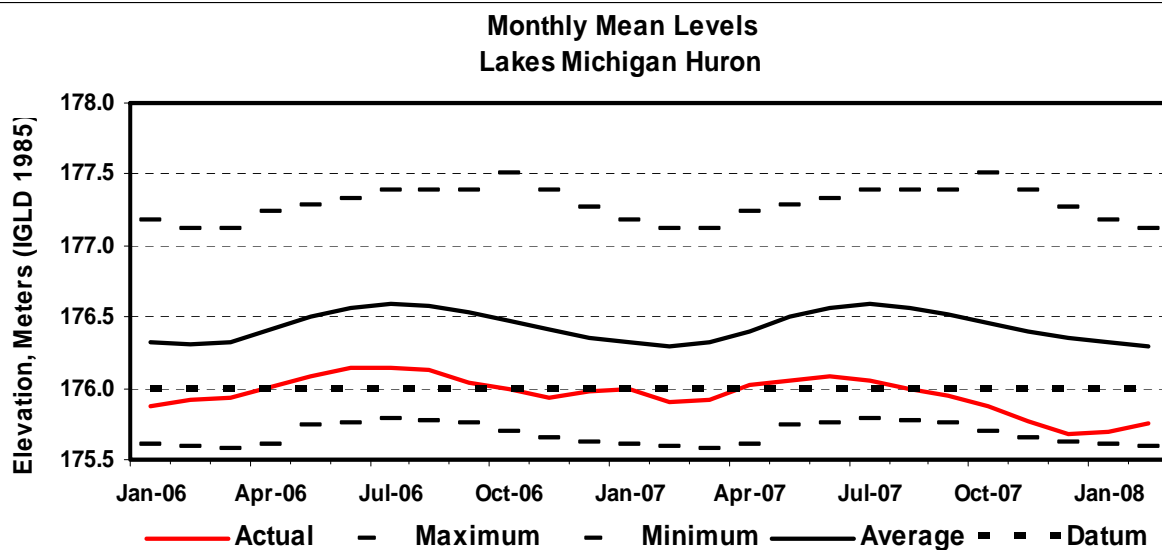
BG Bruce A. Berwick  
Member for United States



David Fay  
Member for Canada

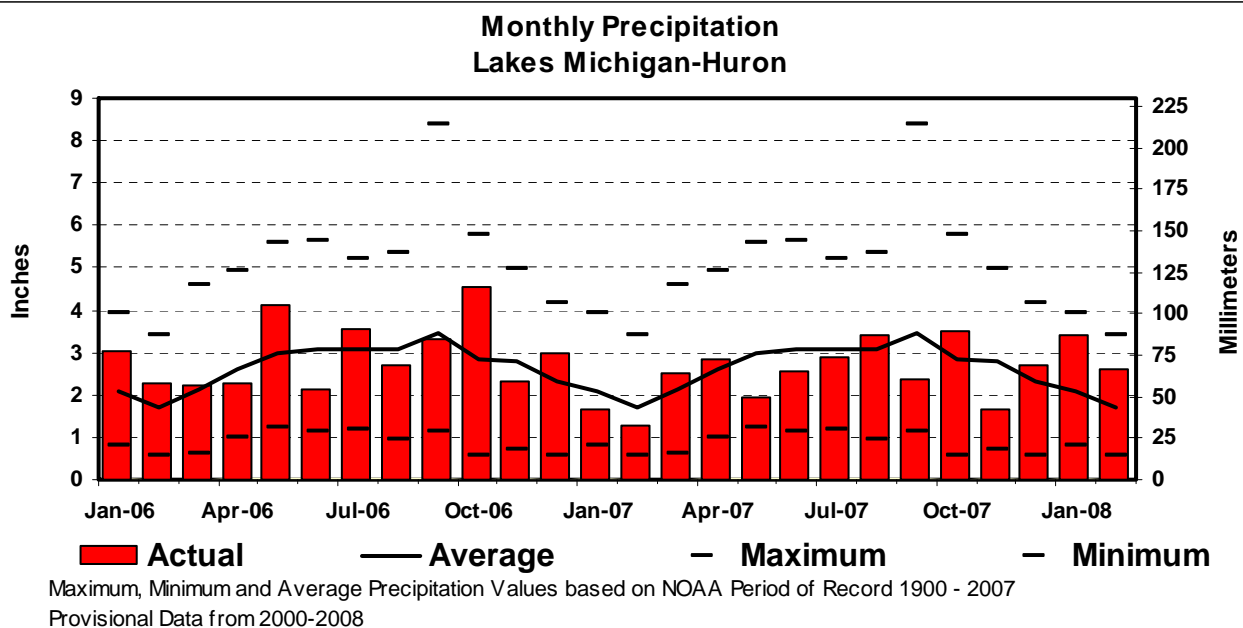
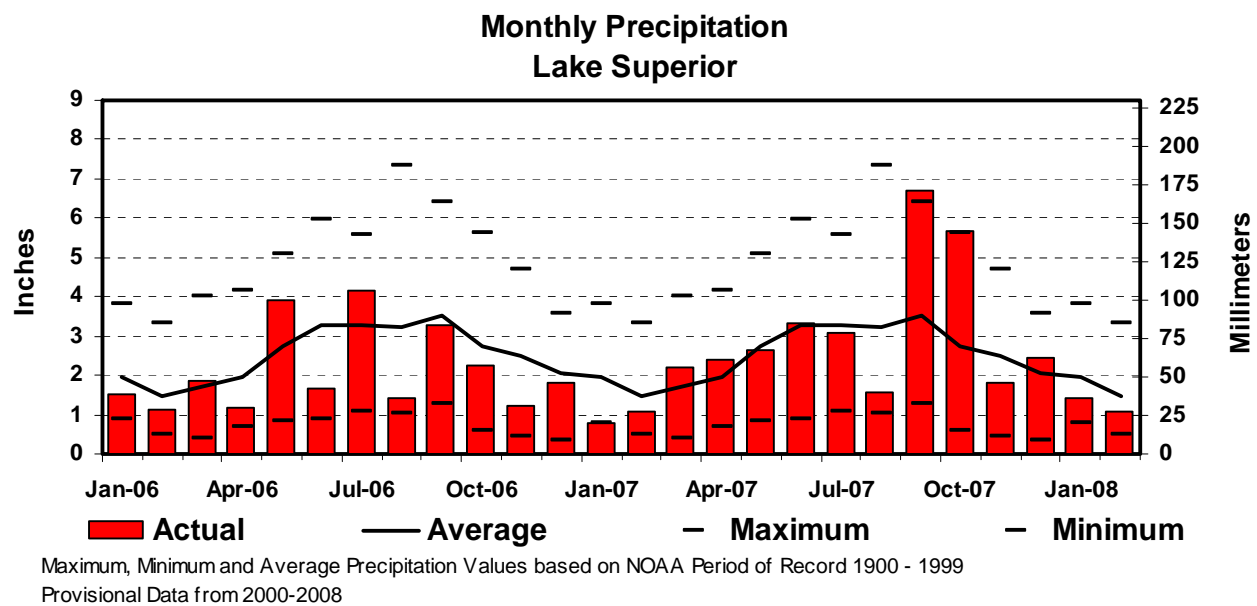


Based on a mean of 5 gages. Average, Maximum and Minimum values for the Period of Record 1918-2007

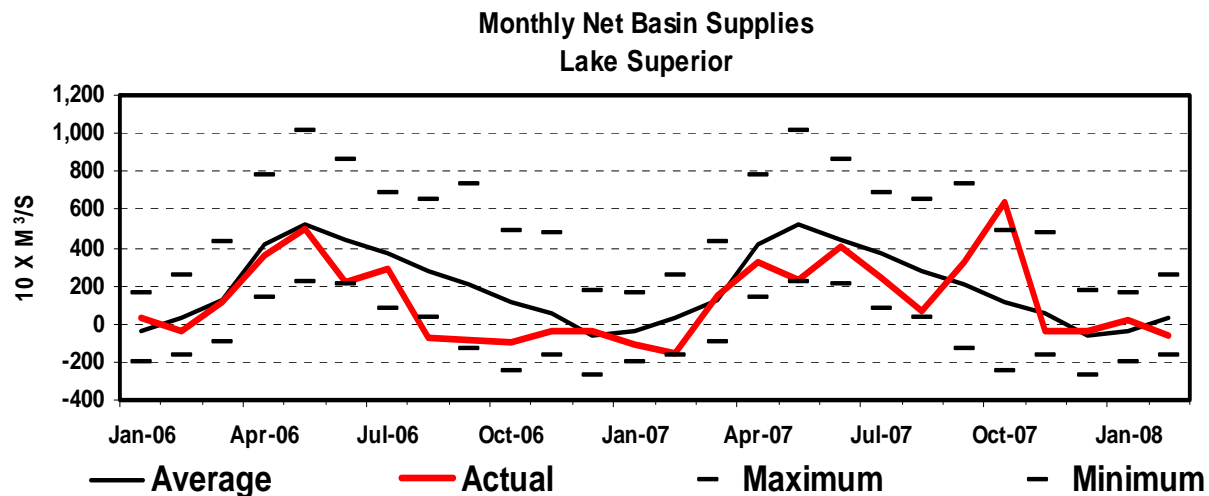


Based on a mean of 6 gages. Average, Maximum and Minimum values for the Period of Record 1918-2007

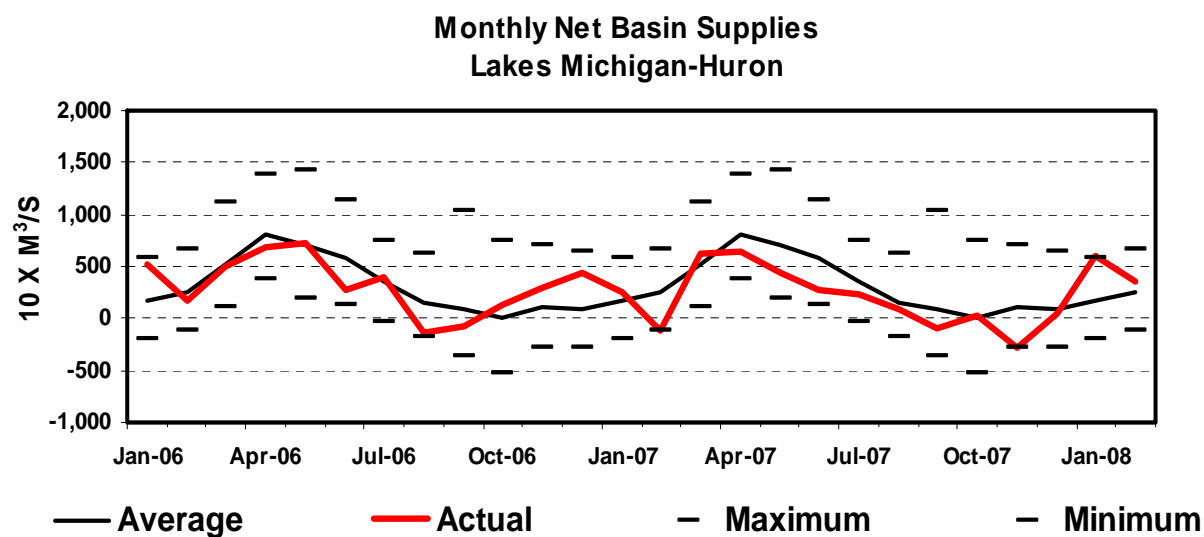
**Figure 1**



**Figure 2**



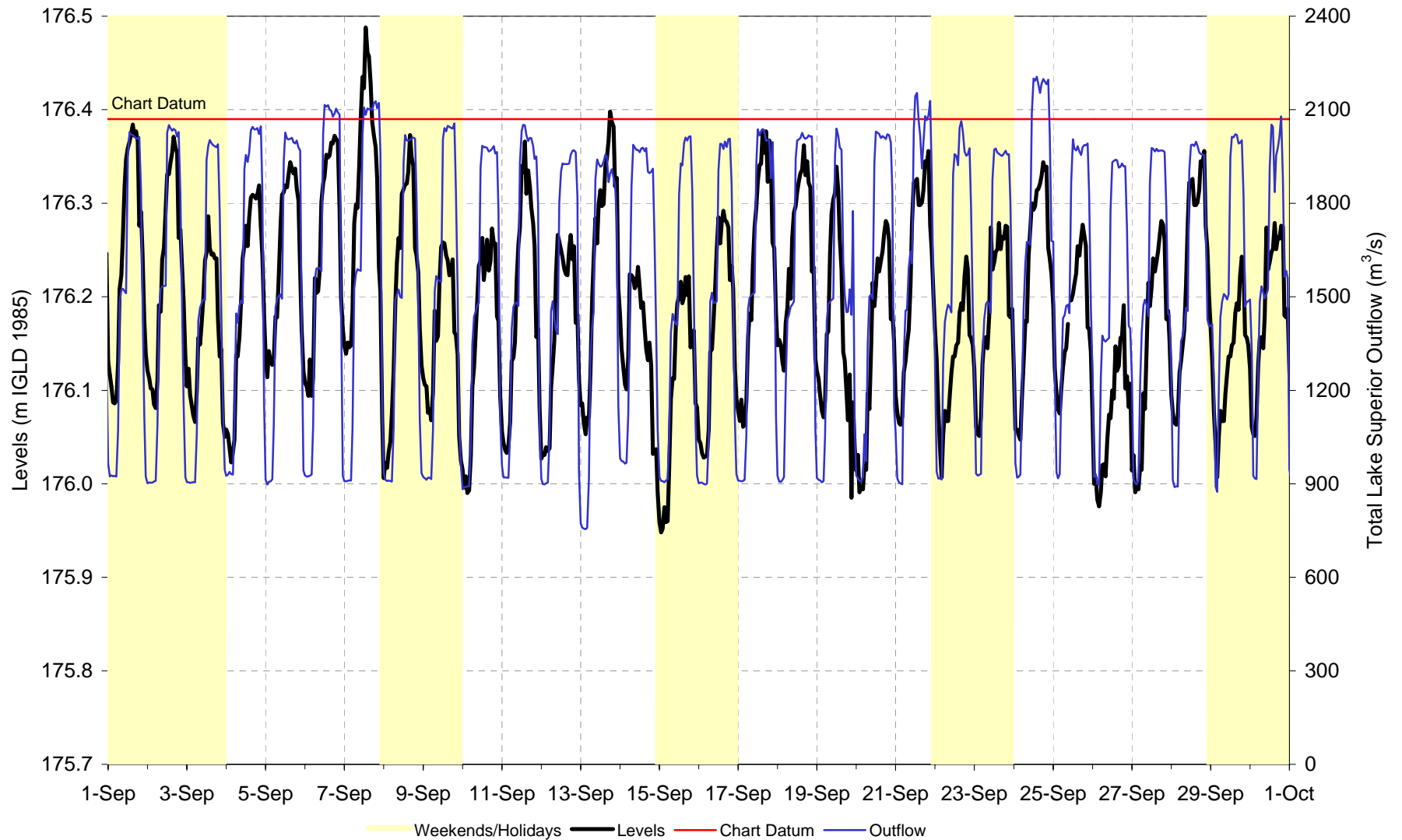
Average, Maximum and Minimum Based on Coordinated Period of Record 1900-1999



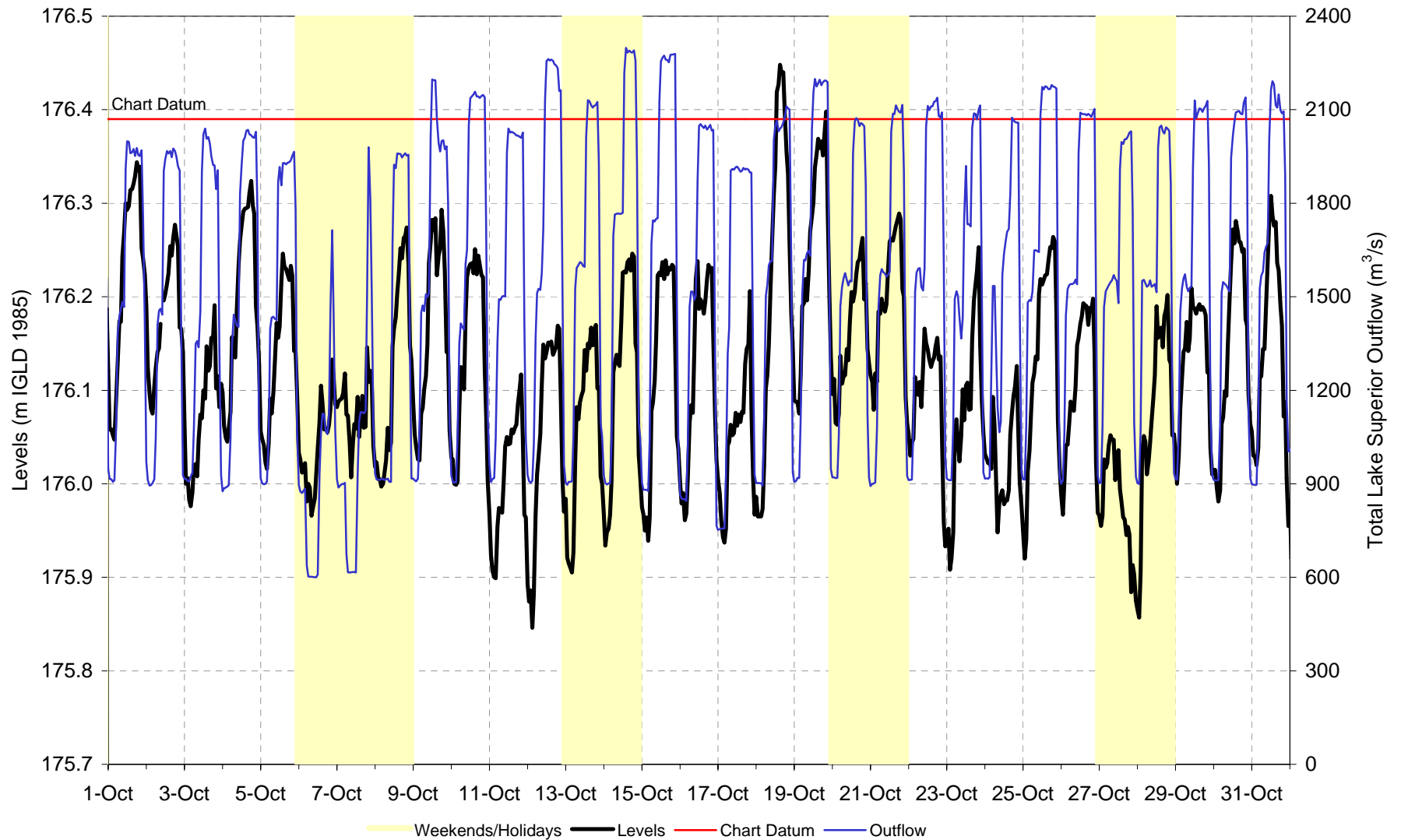
Average, Maximum and Minimum Based on Coordinated Period of Record 1900-1999

**Figure 3**

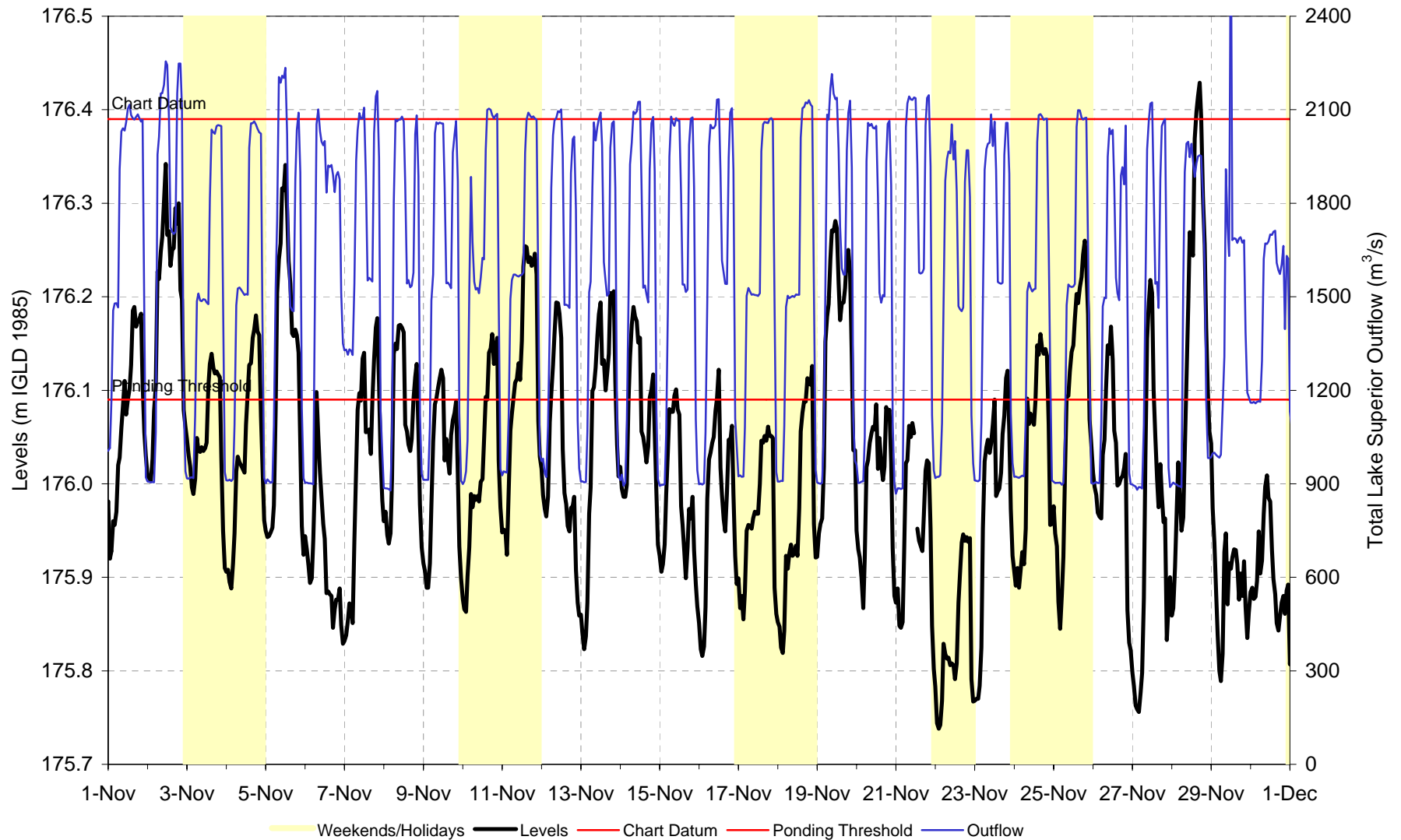
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4a - September 2007



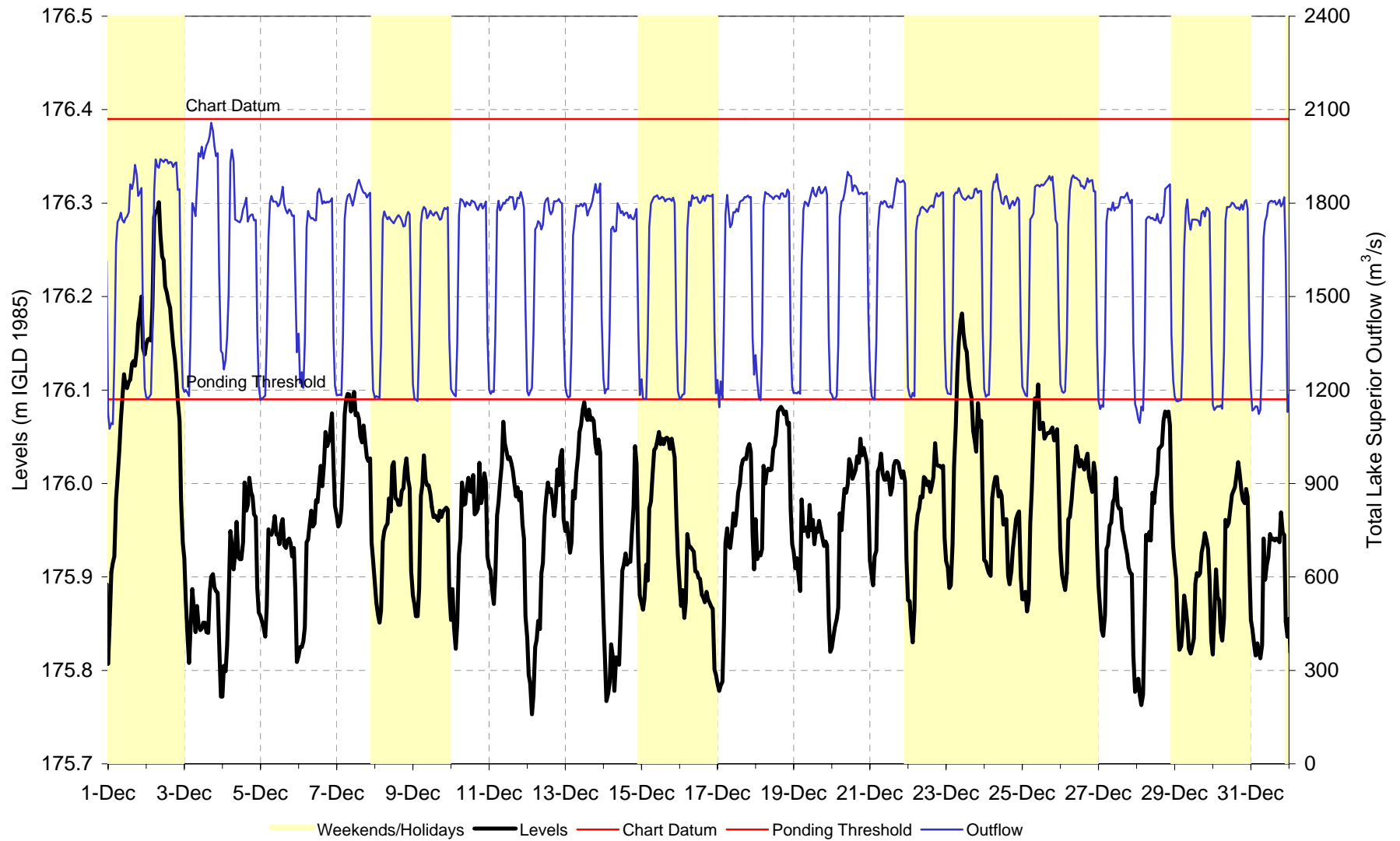
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4b - October 2007



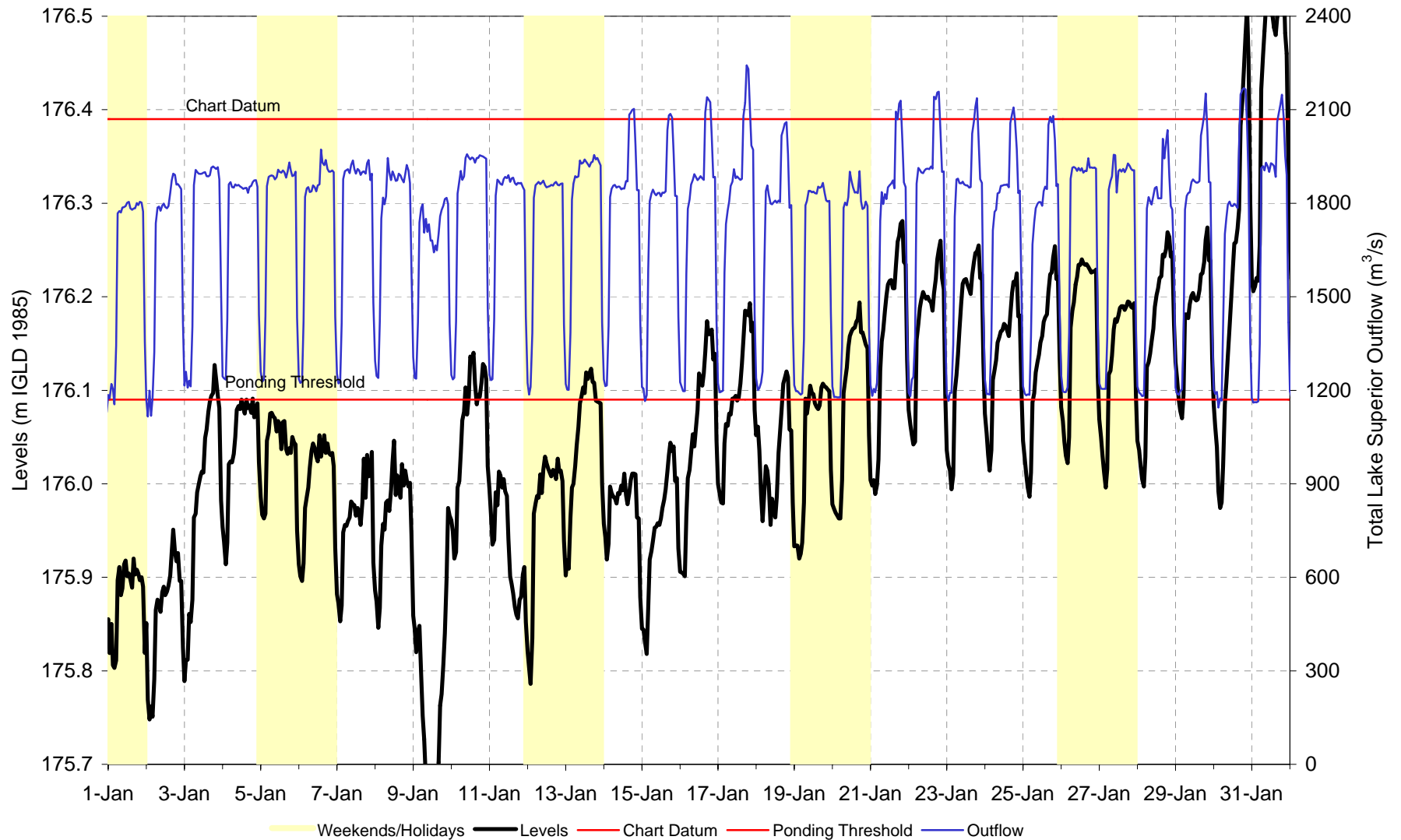
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4c - November 2007



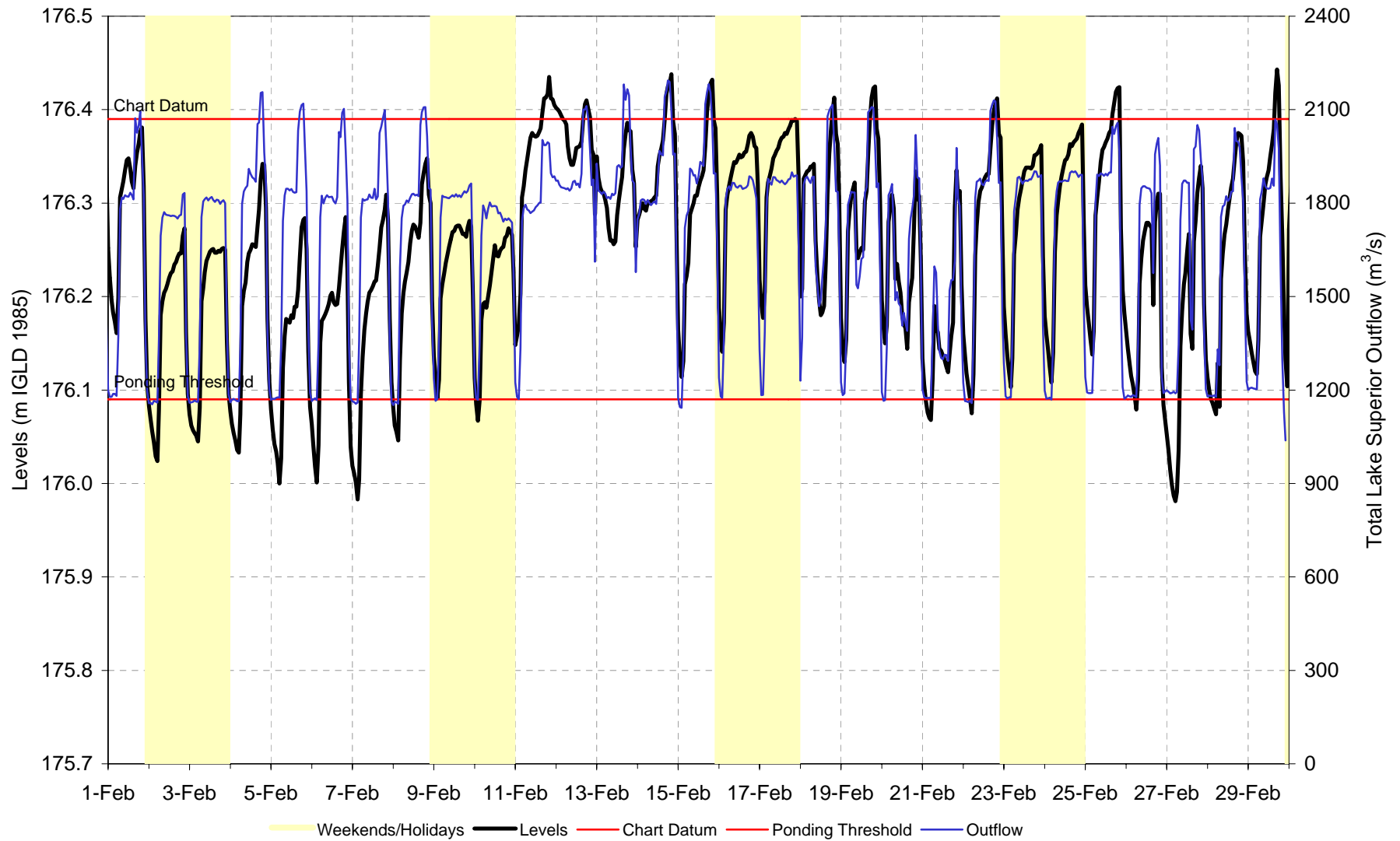
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4d - December 2007



Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4e - January 2008



Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4f - February 2008



**TABLE 1. 2007 - 2008 Lake Superior Hydrologic Factors**

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedance Probability <sup>3</sup>	Monthly Mean Recorded		Percent of
	Meters	Feet	Meters	Feet	m3/s	tcfs	(%)	m3/s	tcfs	Average <sup>4</sup>
<b>2007</b>										
JAN	182.92	600.13	-0.42	-1.38	-1,050	-37	84	1,540	54	79
FEB	182.83	599.84	-0.45	-1.48	-1,530	-54	>>99	1,360	48	71
MAR	182.79	599.70	-0.45	-1.48	1,530	54	39	1,280	45	68
APR	182.85	599.90	-0.42	-1.38	3,230	114	74	1,390	49	71
MAY	182.87	599.97	-0.50	-1.64	2,360	83	97	1,490	53	70
JUN	182.94	600.20	-0.51	-1.67	4,070	144	56	1,510	53	69
JUL	183.00	600.39	-0.52	-1.71	2,440	86	86	1,530	54	67
AUG	183.01	600.43	-0.53	-1.74	630	22	97	1,540	54	65
SEP	183.02	600.46	-0.52	-1.71	3,210	113	19	1,560	55	66
OCT	183.18	600.98	-0.34	-1.12	6,390	226	<<1**	1,560	55	68
NOV	183.18	600.98	-0.30	-0.98	-370	-13	75	1,570	55	69
DEC	183.11	600.75	-0.30	-0.98	-400	-14	38	1,650	58	80
<b>2008</b>										
JAN	183.08	600.66	-0.26	-0.85	260	9	18	1,730	61	89
FEB*	183.03	600.49	-0.25	-0.82	-670	-24	89	1,690	60	88

Notes: m3/s = cubic meters per second

tcfs = 1,000 cubic per second

<sup>1</sup> Water Levels are a mean of five gauges on Lake Superior, IGLD 1985

<sup>2</sup> Average levels are for the period 1918-2007, based on a mean of five gauges. Differences computed as meters and then converted to feet.

<sup>3</sup> Exceedance probabilities are based on 1900 - 1999.

<sup>4</sup> Average flows are for the period 1900 - 1999.

\* Provisional estimates.

\*\* New record high net basin supply

**TABLE 2. 2007 - 2008 Lakes Michigan-Huron Hydrologic Factors**

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedance Probability <sup>3</sup>	Monthly Mean Recorded		Percent of
	Meters	Feet	Meters	Feet	m3/s	tcfs	(%)	m3/s	tcfs	Average <sup>4</sup>
<b>2007</b>										
JAN	176.00	577.43	-0.32	-1.05	2,520	89	27	4,420	156	98
FEB	175.91	577.13	-0.39	-1.28	-1,140	-40	>>99	3,700	131	84
MAR	175.92	577.17	-0.40	-1.31	6,170	218	33	4,230	149	87
APR	176.02	577.49	-0.38	-1.25	6,390	226	74	4,560	161	89
MAY	176.06	577.62	-0.44	-1.44	4,460	158	89	4,520	160	84
JUN	176.08	577.69	-0.48	-1.57	2,730	96	96	4,600	162	84
JUL	176.05	577.59	-0.54	-1.77	2,350	83	80	4,680	165	84
AUG	176.00	577.43	-0.57	-1.87	910	32	64	4,590	162	83
SEP	175.95	577.26	-0.57	-1.87	-990	-35	82	4,500	159	82
OCT	175.88	577.03	-0.58	-1.9	320	11	41	4,470	158	82
NOV	175.77	576.67	-0.63	-2.07	-2,860	-101	>>99**	4,430	156	82
DEC	175.68	576.38	-0.67	-2.2	420	15	57	4,210	149	81
<b>2008</b>										
JAN	175.70	576.44	-0.62	-2.03	6,010	212	<<1***	4,080	144	90
FEB*	175.76	576.64	-0.54	-1.77	3,490	123	22	3,740	132	85

Notes:      m<sup>3</sup>/s = cubic meters per second                      tcfs = 1,000 cubic per second

<sup>1</sup> Water Levels are a mean of six gauges on Lakes Michigan-Huron, IGLD 1985

<sup>2</sup> Average levels are for the period 1918-2007, based on a mean of six gauges. Differences computed as meters and then converted to feet.

<sup>3</sup> Exceedance probabilities are based on 1900 - 1999.

<sup>4</sup> Average flows are for the period 1900 - 1999.

\* Provisional estimates.

\*\* New record low net basin supply

\*\*\* New record high net basin supply

**TABLE 3**  
**MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (Cubic Meters / Second)**

	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				Fishery	Total Lake
Year and Month	U.S. Govern't Hydro	Edison Sault Electric	US Total	Brookfield Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow (m <sup>3</sup> /s)
<b>2007</b>														
JAN	398	320	718	710	1,428	5.0	0.0	5	0.2	9.4	0.3	10	97	1,540
FEB	296	319	615	643	1,258	2.1	0.0	2	0.2	8.0	0.3	8	96	1,364
MAR	338	248	586	585	1,171	4.0	0.0	4	0.2	8.3	0.3	9	94	1,278
APR	379	251	630	641	1,271	11.3	0.0	11	0.2	8.8	0.3	9	96	1,387
MAY	368	341	709	671	1,380	12.9	0.5	13	0.3	9.7	0.3	10	83	1,486
JUN	348	341	689	709	1,398	14.3	1.6	16	0.4	10.1	0.3	11	82	1,507
JUL	346	351	697	722	1,419	14.6	2.2	17	0.4	8.3	0.3	9	81	1,526
AUG	360	353	713	721	1,434	14.8	2.1	17	0.4	8.5	0.3	9	81	1,541
SEP	392	335	727	727	1,454	14.0	0.9	15	0.3	10.5	0.3	11	81	1,561
OCT	395	337	732	720	1,452	12.0	0.0	12	0.3	10.2	0.3	11	83	1,558
NOV	403	332	735	727	1,462	10.4	0.0	10	0.3	10.2	0.3	11	84	1,567
DEC	401	374	775	769	1,544	10.4	0.0	10	0.3	9.3	0.3	10	84	1,648
<b>2008</b>														
JAN	405	411	816	812	1,628	5.6	0.0	6	0.2	10.2	0.3	11	84	1,729
FEB	401	401	802	791	1,593	2.1	0.0	2	0.2	9.5	0.3	10	83	1,688

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS.

**TABLE 4**  
**MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (Cubic Feet / Second)**

	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				Fishery	Total Lake
Year and Month	U.S. Govern't Hydro	Edison Sault Electric	US Total	Brookfield Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow (cfs)
<b>2007</b>														
JAN	14,100	11,300	25,400	25,100	50,500	177	0	177	7	332	11	350	3,430	54,500
FEB	10,500	11,300	21,800	22,700	44,500	74	0	74	7	283	11	301	3,390	48,300
MAR	11,900	8,800	20,700	20,700	41,400	141	0	141	7	293	11	311	3,320	45,200
APR	13,400	8,900	22,300	22,600	44,900	399	0	399	7	311	11	329	3,390	49,000
MAY	13,000	12,000	25,000	23,700	48,700	456	18	474	11	343	11	365	2,930	52,500
JUN	12,300	12,000	24,300	25,000	49,300	505	57	562	14	357	11	382	2,900	53,100
JUL	12,200	12,400	24,600	25,500	50,100	516	78	594	14	293	11	318	2,860	53,900
AUG	12,700	12,500	25,200	25,500	50,700	523	74	597	14	300	11	325	2,860	54,500
SEP	13,800	11,800	25,600	25,700	51,300	494	32	526	11	371	11	393	2,860	55,100
OCT	13,900	11,900	25,800	25,400	51,200	424	0	424	11	360	11	382	2,930	54,900
NOV	14,200	11,700	25,900	25,700	51,600	367	0	367	11	360	11	382	2,970	55,300
DEC	14,200	13,200	27,400	27,200	54,600	367	0	367	11	328	11	350	2,970	58,300
<b>2008</b>														
JAN	14,300	14,500	28,800	28,700	57,500	198	0	198	7	360	11	378	2,970	61,000
FEB	14,200	14,200	28,400	27,900	56,300	74	0	74	7	335	11	353	2,930	59,600

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

NOTE: Flows for individual users were originally coordinated in m3/s, and are converted here to U.S. customary units (cfs) and rounded to 3 significant figures. Total flow for each category and total Lake Superior flow in this table are computed from the individual flows in cfs.